

PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of)
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JOCHEM VAN DE WEERD)
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Serial No. 10/808,001) Group Art Unit: 1764
)
Filed March 24, 2004) Examiner: Ellen M. McAvoy
)
METHOD OF INCREASING THE CARBON) July 16, 2008
CHAIN LENGTH OF OLEFINIC COMPOUNDS)
)

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COMMISSIONER FOR PATENTS
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

The Appellants hereby file this appeal brief in response to the final rejection of September 21, 2007 of claims 1-11.

Real Party in Interest

The real party in interest is Shell Oil Company.

Related Proceedings

There are no related proceedings.

Status of the Claims

Claims 1-11 were filed in the original application and they have not been amended.

Status of Amendments

No amendments have been filed subsequent to the final rejection.

Summary of Claimed Subject Matter

Claim 1 describes a process for increasing the carbon chain length of an olefinic compound by subjecting it to hydroformylation to produce an aldehyde and/or alcohol with an increased carbon chain length compared to the starting olefin, optionally hydrogenating the aldehyde that forms to convert it to an alcohol which has an increased carbon chain length compared to the starting olefin, dehydrating the alcohol to produce an olefinic compound with an increased carbon chain length compared to the starting olefinic compound. All of these claim elements are described in the specification at page 2, lines 17 through 33. Hydroformylation is described in the specification beginning at page 4, line 16 through page 7, line 5. Dehydration is described in the specification beginning at page 7, line 6 through page 8, line 33.

Grounds of Rejection to be Reviewed on Appeal

The only ground of rejection to be reviewed upon appeal is whether or not all of the claims presented upon appeal are obvious under Section 103(a) as being unpatentable over US Patent No. 6,037,506 (Bolinger) in combination with US Patent No. 6,627,782 (Kaizik et al.).

Argument

As described above, the present invention is a process for increasing the carbon chain length of an olefinic compound. It is a process which starts with an olefin and ends up with an olefin with one more carbon atom in the chain. Neither Bolinger nor Kaizik et al. describe a process for increasing the carbon chain length of an olefin. Neither of these references suggests a process for increasing the carbon chain length of an olefin. There is simply nothing in either one of these references that relates to the subject matter of the claims of the present invention.

Bolinger describes a process for hydroformylation of an olefin by reacting it with carbon monoxide in hydrogen to produce an alcohol. Aldehydes or esters may also be formed. These are the end products of the process of the reference.

Kaizik et al. describe a multi stage synthesis for preparing 1-olefins from aldehydes. The aldehyde is condensed with acetone to form an unsaturated ketone. The unsaturated ketone is hydrogenated to yield a saturated alcohol. The saturated alcohol is dehydrated to produce a 1-olefin. Aldehydes are the starting material for the process of this invention, not olefins. In fact, the reference describes an alternative process for making 1-olefins which involves other olefins. That process is described at column 1, lines 34-39 and involves dehydration of straight chain paraffins to form internal olefins which are then converted into 1-olefins by cross metathesis. This reference teaches away from a process of making olefins from other olefins by describing the disadvantage of the dehydration/cross metathesis process which is that a large number of different 1-olefins is produced. Thus, one of ordinary skill in the art would not be led to combine Kaizik et al. with Bolinger.

Conclusion

Based upon the above argument, the Applicants request that the Examiner's rejection be overturned upon this appeal.

Respectfully submitted,

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CLAIMS APPENDIX

1. A process of increasing the carbon chain length of an olefinic compound comprising the steps of:
 - a) providing a starting olefinic compound and subjecting it to hydroformylation to produce an aldehyde and/or alcohol with an increased carbon chain length compared to the starting olefinic compound;
 - b) optionally, hydrogenating the aldehyde that forms during the hydroformylation reaction to convert it to an alcohol which has an increased carbon chain length compared to the starting olefinic compound; and
 - c) subjecting the alcohol with the increased carbon chain length to dehydration to produce an olefinic compound with an increased carbon chain length compared to the starting olefinic compound.
2. The process of claim 1 wherein the carbon chain length of an olefinic compound with an odd number of carbon atoms is increased by one carbon to an α -olefinic compound with an even number of carbon atoms.
3. The process of claim 2 wherein 1-pentene is converted to 1-hexene.
4. The process of claim 2 wherein 1-heptene is converted to 1-octene.
5. The process of claim 1 wherein the starting olefinic compound comprises an unbranched linear α -olefin with a single carbon-carbon double bond.
6. The process of claim 1 wherein a Fischer-Tropsch derived feed stream containing one or more olefins is used as the starting olefinic compound.
7. The process of claim 1 wherein the hydroformylation is carried out by reacting the olefinic compound with carbon monoxide and hydrogen in the presence of a suitable catalyst.
8. The process of claim 1 wherein significant amounts of aldehyde are produced during hydroformylation and the process includes the step of hydrogenating the aldehyde to convert it to an alcohol which has an increased carbon chain length compared to the starting olefinic compound.
9. The process of claim 1 which includes the removal of unwanted products before or after the dehydration step.

10. The process of claim 9 where unwanted alcohols or aldehydes are removed prior to the dehydration step.

An olefinic compound produced by the process of claim 1.

EVIDENCE APPENDIX

No additional evidence is submitted with this brief.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings.